IN THE CLAIMS:

1. (Currently Amended) An electrochemical plating cell, comprising:

a fluid basin for plating having an anolyte solution compartment and a catholyte solution compartment;

an ionic membrane positioned between the anolyte solution compartment and the catholyte solution compartment; ~~and~~

an anode positioned in the anolyte solution compartment; and

a diffusion member positioned in the catholyte compartment, wherein the ionic membrane comprises a poly tetrafluoroethylene based ionomer.

2. (Original) The electrochemical plating cell of claim 1, wherein the ionic membrane further comprises a cationic membrane based on a fluorized polymer matrix.

3. (Original) The electrochemical plating cell of claim 1, wherein the ionic membrane includes a fluorized matrix configured to be chemically stable in both acidic and concentrated basic solutions.

4. (Original) The electrochemical plating cell of claim 1, wherein the ionic membrane comprises a perfluorinated polymer containing at least one of sulfonic and carboxylic ionic functional groups.

5. (Original) The electrochemical plating cell of claim 4, wherein the ionic membrane is configured to transmit between about 94% and about 98% of metal ions therethrough at plating current densities of between about 5 mA/cm^2 and about 20 mA/cm^2.

6. (Original) The electrochemical plating cell of claim 4, wherein the ionic membrane is configured to transmit between about 93% and about 97% of metal ions therethrough at plating current densities of between about 20 mA/cm^2 and about 60 mA/cm^2.

7. (Original) The electrochemical plating cell of claim 2, wherein the ionic membrane comprises a conductivity of between about 20 ohm cm^2 and about 45 ohm cm^2 at a plating current density of about 10 mA/cm^2.

8. (Original) The electrochemical plating cell of claim 7, wherein the ionic membrane comprises a conductivity of between about 20 ohm cm^2 and about 30 ohm cm^2 at a plating current density of about 10 mA/cm^2.

9. (Original) The electrochemical plating cell of claim 2, wherein the ionic membrane comprises a water transfer of between about 3 ml/Amphr and about 7.5 ml/Amphr.

10. (Original) The electrochemical plating cell of claim 1, wherein the ionic membrane comprises a polydivinilbenzol matrix.

11. (Currently Amended) An electrochemical plating cell, comprising:

an anolyte compartment configured to contain an anolyte solution;

a catholyte compartment configured to contain a catholyte solution for plating a metal onto a substrate;

a cationic membrane positioned to separate the catholyte compartment from the anolyte compartment;

an anode positioned in the anolyte compartment; and

a diffusion member positioned in the catholyte compartment ~~chamber~~ between the cationic membrane and a substrate plating position,

wherein the cationic membrane includes a fluorized polymer matrix.

12. (Original) The electrochemical plating cell of claim 11, wherein the cationic membrane comprises a poly tetrafluoroethylene based ionomer.

13. (Original) The electrochemical plating cell of claim 12, wherein the cationic membrane comprises a perfluorinated polymer containing at least one of sulfonic and carboxylic ionic functional groups.

14. (Original) The electrochemical plating cell of claim 13, wherein the cationic membrane is configured to transmit between about 94% and about 98% of metal ions therethrough at plating current densities of between about 5 mA/cm^2 and about 20 mA/cm^2.

15. (Original) The electrochemical plating cell of claim 13, wherein the ionic membrane is configured to transmit between about 93% and about 97% of metal ions therethrough at plating current densities of between about 20 mA/cm^2 and about 60 mA/cm^2.

16. (Original) The electrochemical plating cell of claim 13, wherein the cationic membrane comprises a conductivity of between about 20 ohm cm^2 and about 45 ohm cm^2 at a plating current density of about 10 mA/cm^2.

17. (Original) The electrochemical plating cell of claim 16, wherein the ionic membrane comprises a conductivity of between about 20 ohm cm^2 and about 30 ohm cm^2 at a plating current density of about 10 mA/cm^2.

18. (Original) An electrochemical plating cell, comprising:

an anolyte compartment positioned in a lower portion of a fluid basin;

a catholyte compartment containing a plating solution and being positioned in an upper portion of the fluid basin where substrates are plated; and

a poly tetrafluoroethylene based ionomer cationic membrane having a fluorized polymer matrix positioned to separate the anolyte compartment from the catholyte compartment.

19. (Original) The electrochemical plating cell of claim 18, further comprising a diffusion member positioned above the cationic membrane in the catholyte compartment.

20. (Original) The electrochemical plating cell of claim 19, wherein the diffusion member is a porous ceramic disk having a uniform thickness.

21. (Original) The electrochemical plating cell of claim 18, wherein the cationic membrane is configured to transmit between about 94% and about 98% of metal ions therethrough at plating current densities of between about 5 mA/cm^2 and about 20 mA/cm^2 and between about 93% and about 97% of metal ions therethrough at plating current densities of between about 20 mA/cm^2 and about 60 mA/cm^2.

22. (Original) The electrochemical plating cell of claim 18, wherein the cationic membrane has a conductivity of between about 20 ohm cm^2 and about 45 ohm cm^2 at a plating current density of about 10 mA/cm^2 and between about 20 ohm cm^2 and about 30 ohm cm^2 at a plating current density of about 10 mA/cm^2.

23. (Original) The electrochemical plating cell of claim 18, wherein the cationic membrane has a water transfer of between about 3 ml/Amphr and about 7.5 ml/Amphr.